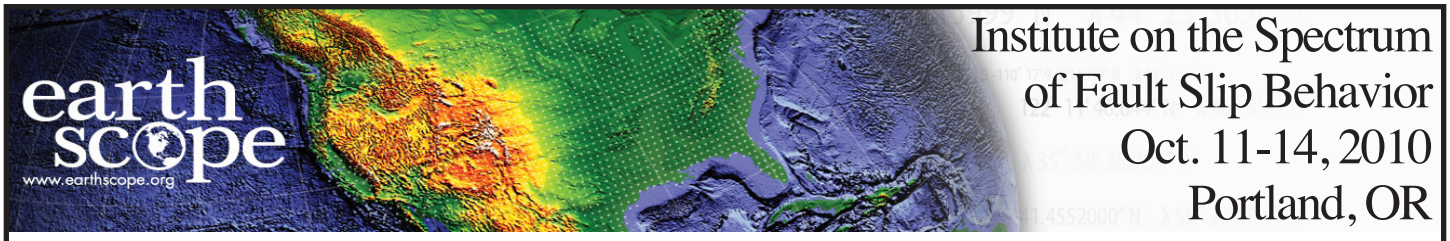


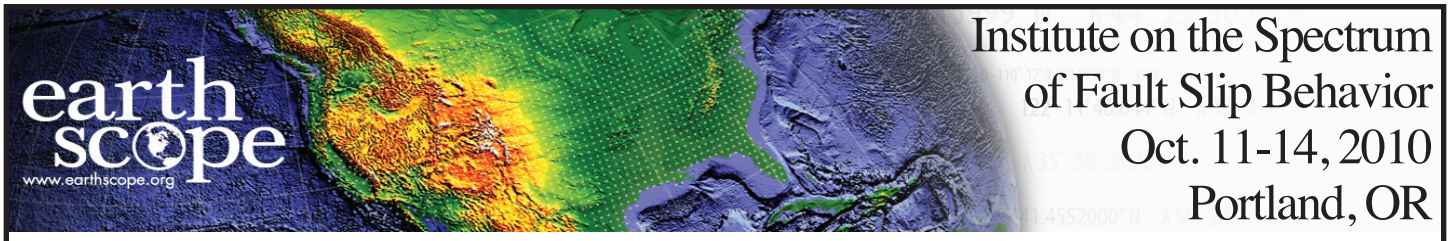
Institute on the Spectrum of Fault Slip Behavior
Oct. 11-14, 2010
Portland, OR

Steering committee: Chris Marone (convenor), Jeff Freymueller (co-convenor), John Vidale (co-convenor), Anne Trehu (co-convenor), Greg Beroza, Mike Brudzinski, Joan Gomberg, and Jeff McGuire

Agenda At-A-Glance

Monday Oct 11: Icebreaker social 20:00 to 23:00, hors d'oeuvres, cash bar. Hotel Fifty

	Tuesday, Oct 12, 2010	Wednesday, Oct 13, 2010	Thursday, Oct 14, 2010
7:00 – 8:30	BREAKFAST (World Trade Center)		
8:30 – 10:00	**The Spectrum of Fault Slip I** Discussion leader: Marone Convener's Intro Beroza Sibson	**Seismic and Geodetic Observations II** Discussion leader: Vidale Lohman Obara	**Lab and Geologic Observations II** Discussion leader: Brudzinski Brodsky Weldon
10:00 – 10:30	COFFEE AND DISCUSSION		
10:30 – 12:30	**The Spectrum of Fault Slip II** Discussion leader: Trehu Fineberg Scholz Vidale	**Theory & Models I** Discussion leader: Beroza Cocco Segall Dieterich	**Theory & Models II** Discussion leader: McGuire Ampuero Wang, K. **Summary of Disciplinary Discussions:** Brudzinski
12:30 – 14:00	LUNCH (World Trade Center)		
14:00 – 15:30	**POSTERS** (World Trade Center) Student Poster Summary Contest	**POSTERS** (World Trade Center)	**The Path Ahead** Discussion leader: Marone Burgmann Lapusta Thatcher Houston Brudzinski
15:30 – 16:00	AFTERNOON BREAK		
16:00 – 18:00	**Seismic and Geodetic Observations I** Discussion leader: Freymueller Shelly Peng McCaffrey	**Lab and Geologic Observations I** Discussion leader: Gomberg Beeler Moore, J Hirth	Adjourn at 5pm.
18:30 – 20:00	DINNER (Hotel Fifty)		
20:30 – 22:00	**POSTERS** (Beer and Wine)	**Emerging Opportunities: A Discussion of Programs and Disciplinary Targets for Progress on The Spectrum of Fault Slip Behaviors** Discussion leader: Vidale	
22:00 – 23:30	**POSTERS** (Beer and Wine)		



Institute on the Spectrum of Fault Slip Behavior
Oct. 11-14, 2010
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Monday, October 11th, 2010

20:00 – 23:00 Reception and registration at Hotel Fifty. Hors d'oeuvres, cash bar.

Tuesday, October 12th, 2010

7:00 – 8:30 BREAKFAST (World Trade Center, Plaza Conference Room: coffee, tea, juice, pastries, fruit)

8:30 – 10:00 **The Spectrum of Fault Slip I** (All sessions in World Trade Center Auditorium)
Discussion leader: Chris Marone
Convener's Intro
Greg Beroza (Stanford): The Slow and the Fast Ends of the Earthquake Spectrum
Rick Sibson (U. Otago): Influence of Fault Infrastructure and Physical Conditions on Slip Style

10:00 – 10:30 COFFEE AND DISCUSSION

10:30 – 12:30 **The Spectrum of Fault Slip II**
Discussion leader: Anne Trehu
Jay Fineberg (Hebrew Univ. of Jerusalem): The Onset of Frictional Slip: Fracture, Friction, and Rupture Mode Selection
Christopher Scholz (LDEO): Slow Slip Events & Related Phenomena: A Discussion of their Mechanism(s)
John Vidale (UW): The Sundry Seismic Motions of Earth - A Spectrum or an Enigma?

12:30 – 14:00 LUNCH (World Trade Center, Plaza Conference Room)

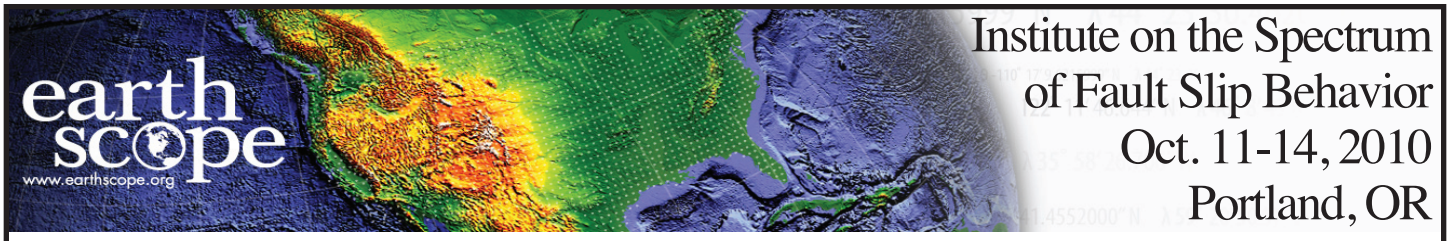
14:00 – 15:30 POSTERS (World Trade Center, Sky Bridge Terrace)
Student Poster Summary Contest

15:30 – 16:00 AFTERNOON BREAK

16:00 – 18:00 **Seismic and Geodetic Observations I**
Discussion leader: Jeff Freymueller
David Shelly (USGS): Variations in Tremor Activity and Implications for Lower Crustal Deformation Along the Central San Andreas Fault, California
Zhigang Peng (Georgia Tech.): Triggering, Tremor, and Slow-Slip Phenomena
Rob McCaffrey (RPI/Portland State University): Geodetic Characterization of Slow Slip in Cascadia and New Zealand

18:30 – 20:00 DINNER (Hotel Fifty)

20:30 – 23:30 POSTERS (World Trade Center, Sky Bridge Terrace)
Beer and Wine



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Wednesday, October 13th, 2010

7:00 – 8:30 BREAKFAST (World Trade Center, Plaza Conference Room: coffee, tea, juice, pastries, fruit)

8:30 – 10:00 **Seismic and Geodetic Observations II**

Discussion leader: John Vidale

Rowena Lohman (Cornell): Geodetic Observations of Transient Deformation in Southern California - How do we Determine Which Ones are "Real"?

Kazushige Obara (U. Tokyo): Depth-Dependent Slip Regime on the Plate Interface Revealed from Slow Earthquake Activities in the Nankai Subduction Zone

10:00 – 10:30 COFFEE AND DISCUSSION

10:30 – 12:30 **Theory & Models I**

Discussion leader: Greg Beroza

Massimo Cocco (INGV Italy): Transient Slip Velocity: From Slow Processes to Earthquake Dynamics

Paul Segall (Stanford): Slow Slip and Dynamic Rupture as a Competition Between Dilatant Strengthening and Thermal Weakening

James Dieterich (UC Riverside): Modeling Fault Creep, Slow Slip Events, and Earthquakes in Fault Systems

12:30 – 14:00 LUNCH (World Trade Center, Plaza Conference Room)

14:00 – 15:30 POSTERS (World Trade Center, Sky Bridge Terrace)

15:30 – 16:00 AFTERNOON BREAK

16:00 – 18:00 **Lab and Geologic Observations I**

Discussion leader: Joan Gomberg

Nick Beeler (USGS): Revisiting Lab Observations of the Deep Stable-Unstable Faulting Transition, Dilatancy, and the Poromechanics of Fault Zones

J. Casey Moore (UCSC): Geologic Context of Fault-Slip Behavior in Accretionary Prisms

Greg Hirth (Brown): Deformation of Serpentinite: Implications for Interpreting the Spectrum of Fault Slip Behavior

18:30 – 20:00 DINNER (Hotel Fifty)

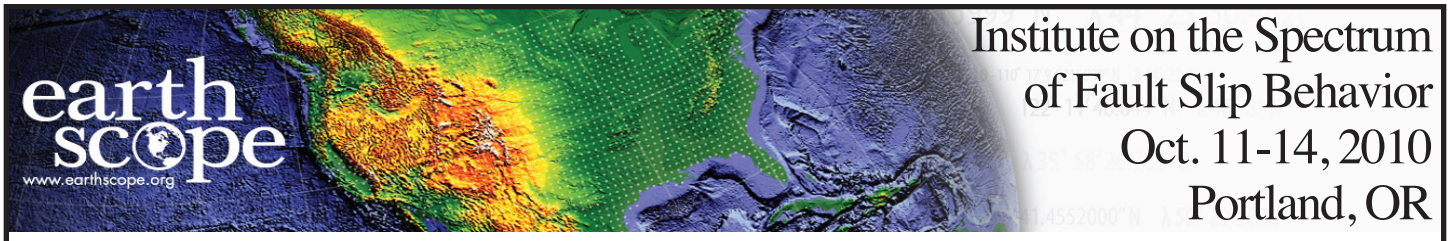
20:30 – 22:00 **Emerging Opportunities: A Discussion of Programs and Disciplinary Targets for Progress on The Spectrum of Fault Slip Behaviors**

Discussion leader: John Vidale

1. Plenary with summaries of connections to EarthScope, Margins/GeoPRISMS, and IODP/NantroSEIZE. (45 min.)
2. Focus Groups: Key questions for community progress on unraveling the spectrum of fault slip behaviors
   - The role of geodesy and geology
   - The role of laboratory and theoretical work
   - The role of seismology

22:00 – 23:30 POSTERS (World Trade Center, Sky Bridge Terrace)

Beer and Wine



Institute on the Spectrum of Fault Slip Behavior
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Thursday, October 14th, 2010

7:00 – 8:30 BREAKFAST (World Trade Center, Plaza Conference Room: coffee, tea, juice, pastries, fruit)

8:30 – 10:00 **Lab and Geologic Observations II**

Discussion leader: Mike Brudzinski

Emily Brodsky (UCSC): The Fault Zone Cycle

Ray Weldon (Oregon): Combining Short and Long Term Records of Deformation to Characterize Strain Above the Cascadia Subduction Zone Interface

10:00 – 10:30 COFFEE AND DISCUSSION

10:30 – 12:30 **Theory & Models II**

Discussion leader: Jeff McGuire

Jean-Paul Ampuero (Caltech): Tremor Migration Patterns and Scaling Laws Resulting From The Interaction of Fault Asperities Mediated by Transient Creep

Kelin Wang (Geological Survey of Canada): Investigating Thermo-Tectonic Conditions for ETS and Similar Events

Summary of Disciplinary Discussions: Mike Brudzinski

12:30 – 14:00 LUNCH (World Trade Center)

14:00 – 17:00 **The Path Ahead**

Discussion leader: Chris Marone

Roland Burgmann (Berkeley): Triggering and Modulation of Slow Slip: Implications for Mechanics and Hazard

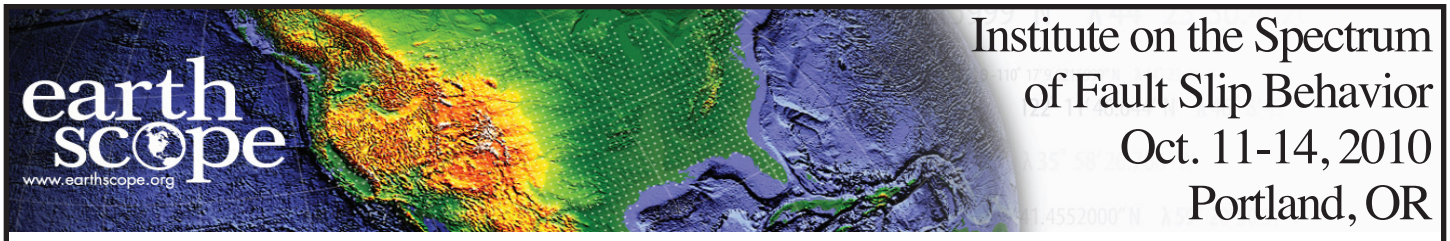
Nadia Lapusta (Caltech): Modeling Approaches That Reproduce a Range of Fault Slip Behaviors: What We Have and What We Need

Wayne Thatcher (USGS): Implications of Transient Fault Slip for Future Work in Tectonic Geodesy

Heidi Houston (UW): Reconciling the Diverse Spectro-Spatio-Temporal Patterns of ETS and Earthquakes

Mike Brudzinski (MU Ohio): Integrating Observations from the Lower Stability Transition of the Seismogenic Zone

17:00 Adjourn



Wednesday, October 13th, 8:30 PM

Emerging Opportunities: A Discussion of Programs and Disciplinary Targets for Progress on The Spectrum of Fault Slip Behaviors

1. Plenary with summaries of connections to EarthScope (C. Estabrook), Margins/GeoPRISMS (J. Morgan), and IODP/NantroSEIZE (H. Tobin). Discussion leader: Vidale (45 min.)

2. Focus Groups: Key questions for community progress on unraveling the spectrum of fault slip behaviors
   - The role of geodesy and geology (Morgan, Freymueller & Brudzinski)
   - The role of laboratory and theoretical work (Tobin, Gomberg & Marone)
   - The role of seismology (Estabrook, Trehu, Vidale & Beroza)

Questions for consideration and to initiate discussion. Please feel free to add to this list.

- What are the mechanisms and physical processes that produce tectonic fault tremor?
- What are the physics that govern the transition from slow to fast TFS? How are the physics of slow, intermediate, and fast TFS phenomena related?
- How best can we foster interdisciplinary connections between researchers in geodesy, seismology, rock mechanics, petrology, hydrogeology, tectonics, and geodynamics?
- Is there a minimum size patch size for tremor, slow earthquakes and other forms of TFS?
- What controls the migration velocity of the various forms of TFS?
- Are there cyber-infrastructure tools or "data products" (broadly defined) that would aid progress in your field? Please consider existing tools or products that need further development, as well as new products.
- How can the EarthScope National Office facilitate interaction and communication among researchers in the field?
- What is the most useful approach for implementing a virtual Institute that will extend the discussions and interactions we start at this workshop?
- What key observations and experiments need to be done?

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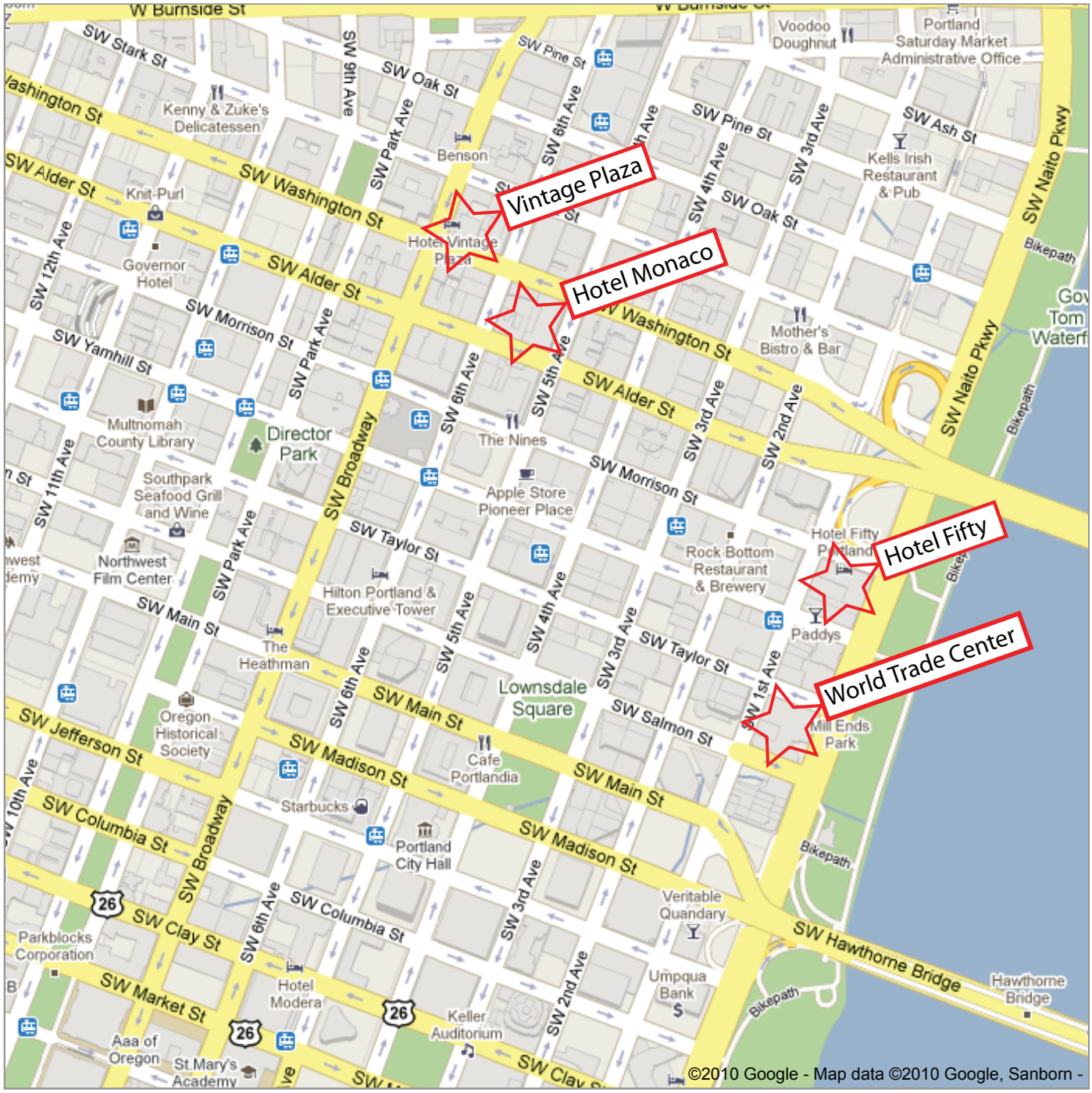

Hotel Fifty: Enter on SW Morrison Street
Vintage Plaza: Enter on SW Broadway or through Pazzo Restaurant on SW Washington
Hotel Monaco: Enter on SW Washington or through Red Star Restaurant on corner of SW Alder and 5th
World Trade Center: Enter on SW Naito Parkway or SW 1st Ave.